

CLAIMS

What is claimed is:

1. A drying system for a semiconductor structure comprising:
a vessel having a top, a bottom, and at least one side, said vessel including a semiconductor stage for disposing the semiconductor structure thereon;
a DI water inlet configured to supply DI water in said vessel to at least partially fill said vessel to a level that would allow the semiconductor structure disposed on said semiconductor stage to be submerged in said DI water;
at least one gas inlet configured to supply a gas inert to the semiconductor structure to substantially fill said vessel so that said gas is maintained above said level of said DI water, the at least one gas inlet is connected to a fail-shut valve, the at least one gas inlet comprising one of an inlet in the top of the vessel and an inlet in said at least one side of the vessel;
a plurality of liquid inlets configured to supply a liquid to the vessel so that said liquid is disposed between said DI water and said gas, said vessel configured such that said semiconductor stage having the semiconductor structure disposed thereon and an upper surface of said DI water move relative to each other so that the semiconductor structure is exposed through said upper surface of said DI water to said gas to rinse and dry the semiconductor structure in said vessel' and
at least one weir located in the vessel..
2. The system of claim 1, wherein the vessel includes a plurality of outlets therefrom.
3. The system of claim 1, further comprising:
at least one outlet in the vessel for allowing the gas or liquid to be removed from the vessel; and
a fail-shut valve connected to the at least one outlet in the vessel.

4. The system of claim 1, further comprising at least one outlet in the bottom of the vessel.

5. The system of claim 1, further comprising at least one outlet in said at least one side of the vessel.

6. The system of claim 1, wherein the vessel comprises a plurality of weirs.

7. The system of claim 1, wherein the vessel includes a plurality of compartments therein.

8. The system of claim 1, wherein the vessel includes a plurality of compartments therein for allowing flow of liquid in the vessel from one compartment to an adjacent compartment.

9. The system of claim 7, further comprising:
at least one outlet connected to each compartment of the plurality of compartments of the vessel.

10. The system of claim 1, further comprising a rinsing apparatus having at least one spray nozzle with a portion thereof located in the vessel.

11. The system of claim 1, wherein the vessel includes a shelf therein located above the bottom of the vessel.

12. The system of claim 11, wherein the shelf includes at least one aperture therein.

13. The system of claim 1, further comprising:
a valve apparatus connected to at least one liquid inlet of the plurality of liquid inlets.

14. The system of claim 1, wherein the vessel comprises a dry etcher.
15. The system of claim 1, wherein the vessel comprises a cascade rinser.
16. The system of claim 1, wherein the vessel comprises an overflow rinser.
17. The system of claim 1, wherein the vessel comprises a Marangoni dryer.
18. The system of claim 1, wherein said semiconductor stage is raisable so that said semiconductor structure is drawn through said upper surface of said DI water to said gas.
19. The system of claim 1, wherein said vessel comprises at least one drain to lower said upper surface of said DI water to facilitate exposing said semiconductor structure to said gas.